



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,898	09/22/2006	Hiroyuki Ohno	063057	4742
38834	7590	02/07/2008	EXAMINER	
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP			WHISENANT, ETHAN C	
1250 CONNECTICUT AVENUE, NW				
SUITE 700			ART UNIT	PAPER NUMBER
WASHINGTON, DC 20036			1634	
			MAIL DATE	DELIVERY MODE
			02/07/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## **Office Action Summary**

**Application No.**

10/593,898

**Applicant(s)**

OHNO ET AL.

**Examiner**

Ethan Whisenant, Ph.D.

**Art Unit**

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### **Status**

- 1) Responsive to communication(s) filed on 22 September 2006.  
2a) This action is **FINAL**.                    2b) This action is non-final.  
3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### **Disposition of Claims**

- 4) Claim(s) 1-7 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) Claim(s) \_\_\_\_\_ is/are allowed.  
6) Claim(s) 1-7 is/are rejected.  
7) Claim(s) \_\_\_\_\_ is/are objected to.  
8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### **Application Papers**

- 9) The specification is objected to by the Examiner.  
10) The drawing(s) filed on 22 September 2006 is/are: a) accepted or b) objected to by the Examiner.  
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### **Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:  
    1. Certified copies of the priority documents have been received.  
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### **Attachment(s)**

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/08)

Paper No(s)/Mail Date \_\_\_\_\_

4) Interview Summary (PTO-413)

Paper No(s)/Mail Date. \_\_\_\_\_

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_

**NON-FINAL ACTION**

1. The applicant's Preliminary Amendment filed 22 SEP 06 has been entered. Following the entry of the Preliminary Amendment, **Claim(s) 1-7** is/are pending.

**35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that may form the basis for rejections set forth in this Office action:

A person shall be entitled to a patent unless --

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.  
or
- (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

**35 USC § 103**

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligations under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

**CLAIM REJECTIONS UNDER 35 USC § 102**

6. Claim(s) 1-6 is/are rejected under 35 U.S.C. 102(b) as anticipated by Shuber [US 5,589,330(1996)].

Shuber teaches a solvent for dissolving nucleic acid characterized by comprising an ionic liquid which can dissolve nucleic acid comprising all of the limitations of Claims 1-6 . See, for example, the TMAC hybridization buffer described in Column 11 at lines 6-20(3.0M TMAC, 0.6% SDS, 1 mM EDTA, 10 mM sodium phosphate pH 6.8, 5X Denhardt's Solution, and 40 ug/ml yeast RNA). TMAC is Tetramethyl ammonium chloride which forms the ionic liquid. The cation is an

ammonium cation. The halide ion when TMAC is dissolved in aqueous solution is Cl<sup>-</sup>. As regards the limitation in Claim 4 that the ionic liquid is neutralized, note that the pH of the hybridization buffer is approximately 6.8. Note that not only is the hybridization buffer of Shuber adapted to react nucleic acid but that nucleic acid within said buffer are preserved.

7. Claim(s) 1-6 is/are rejected under 35 U.S.C. 102(b) as anticipated by Ohno et al. [J. of The Electrochemical Society (2001)].

Ohno et al teaches a solvent for dissolving nucleic acid characterized by comprising an ionic liquid which can dissolve nucleic acid comprising all of the limitations of Claims 1-6.. See, for example, the preparation of Ethylimidazolium tetrafluoborate (EtImBF<sub>4</sub>) by neutralization of N-ethylimidazole with HBF<sub>4</sub>. This ionic liquid was then used to dissolve DNA. See at least Column 2 on E168. As regards the limitation in Claim 5 which reads : "which is characterized by being adapted to preserve nucleic acid or react nucleic acid, these limitations are directed to the intended use of the solvent and therefore do not further limit the claimed invention. Regardless, the limitation of preserving nucleic acid is in the examiners opinion inherent to the EtImBF<sub>4</sub> disclosed by Ohno et al. Note Especially Figure 2.

### **CLAIM REJECTIONS UNDER 35 USC § 102/103**

8. **Claim(s) 7** is/are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shuber [US 5,589,330(1996)] or Ohno et al. [J. of The Electrochemical Society (2001)].

**Claim 7** is drawn to a method for preserving nucleic acid, characterized by preserving nucleic acid in a dissolved state within an ionic liquid.

Shuber teach a method of hybridization which comprises all of the limitations of Claim 7 except Shuber does not explicitly teach that the nucleic acid dissolved in their hybridization buffer is preserved. However, this limitation is considered inherent to the hybridization buffer of Shuber. Note the positive hybridization results. If nucleic acids within the hybridization buffer were not preserved (i.e. they were degraded) a no hybridization signal would have been detected.

Likewise Ohno et al. teach a method comprising all of the limitations of Claim 7 except Ohno et al. do not explicitly teach that the nucleic acid dissolved in their ionic liquid is preserved. However, this limitation is considered inherent to the ionic liquids formed by Ohno et al. Note the results of Figure 2. If the nucleic acids within the ionic liquids were not preserved (i.e. they were degraded) a signal similar to that of ionic liquid alone would have been seen.

### **CONCLUSION**

9. **Claim(s) 1-7** is/are rejected and/or objected to for the reason(s) set forth above.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ethan Whisenant, Ph.D. whose telephone number is

(571) 272-0754. The examiner can normally be reached Monday-Friday from 8:30AM - 5:30PM EST or any time via voice mail. If repeated attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla, can be reached at (571) 272-0735.

The Central Fax number for the USPTO is (571) 273-8300. Please note that the faxing of papers must conform with the Notice to Comply published in the Official Gazette, 1096 OG 30 (November 15, 1989).

/Ethan Whisenant/  
Primary Examiner  
Art Unit 1634